The present inventors have discovered that a plant hormone signal transduction gene can be used as the selectable marker gene in order to identify plants and plant tissue which express the desired gene. Using the plant hormone signal transduction gene as the selectable marker, the selection efficiency is dramatically improved.

The rejection of Claims 1, 5, and 6 under 35 U.S.C. §102(b) over Kakimoto et al. is respectfully traversed. This reference fails to describe the claimed vector.

Kakimoto et al. describe a vector in which CKI1, a plant hormone signal transduction gene, is the desired gene and an antibiotic resistance gene was used as the selectable marker gene (see page 983). This is evident from Nos. 5 and 6 in the References and Notes at page 985 of the reference. As described therein, a cytokinin-independent mutant which was obtained by introducing the desired CKI1 gene was obtained was selected using the resistance to the antibiotic hygromycin as a selectable marker.

Kakimoto et al. fail to describe a vector containing (1) a desired gene which is not a plant hormone signal transduction gene and (2) a plant hormone signal transduction gene as a selectable marker gene. Therefore, the reference fails to describe the claimed vector.

Moreover, Kakimoto et al. fail to suggest the claimed vector. There is no suggestion in this reference to construct a vector in which the desired gene is not a selectable marker gene. In Kakimoto et al., the desired gene is a plant hormone signal transduction gene, which is a selectable marker gene.

Based on the foregoing, Claims 1-13 are not anticipated by or obvious over Kakimoto et al. Withdrawal of this ground of rejection is respectfully requested.

The rejections of Claims 1-9 under 35 U.S.C. §103(a) over European Patent No. 0 716 147 (EP '147) or U.S. Patent No. 5,965,791 (U.S. '791) in view of Kakimoto et al. are respectfully traversed. These references fail to suggest the claimed vector.

EP '147 and U.S. '791 appear to be part of the same patent family. Accordingly, these references will be discussed with reference to U.S. '791.

U.S. '791 describes a vector containing a desired gene and a morphological abnormality induction (MAI) gene as a selectable marker (see the abstract). As recognized by the Examiner, this reference fails to teach a vector containing a plant hormone signal transduction gene (see the Official Action at page 9, numbered paragraph 41).

EP '147 or U.S. '791, taken in combination with together with Kakimoto et al. fail to suggest the claimed vector. None of these vectors provide any suggestion or motivation for a vector which contains a desired gene which is not a selectable marker gene and a plant hormone signal transduction gene as a selectable marker gene. In Kakimoto et al. the desired gene is a plant hormone signal transduction gene, which is a selectable marker gene. EP '147 and U.S. '791 both, as recognized by the Examiner fail to teach a plant hormone signal transduction gene at all. Accordingly, one with EP '147 or U.S. '791 and Kakimoto et al. in hand would have no motivation to construct the claimed vector.

In addition, the experimental data set forth in the present specification is striking evidence of non-obviousness. The data demonstrate the unexpected effect that selection efficiency of gene-introduced tissue can be improved by selecting and using the plant hormone signal transduction gene as the selectable marker gene as compared to the vector described in EP '147 or U.S. '791 (see page 22, the first full paragraph; paragraph bridging pages 32 and 33; page 35, the first full paragraph, *etc.* in the present specification). For example, in Examples 1 and 2, the *CKI1* gene is used as the selectable marker gene so that 100% desired gene (GUS gene)-introduced tissue is selected by using the morphology such as multiple buds as the index (see paragraph bridging pages 32 and 33; page 35, the first full paragraph in the present specification). On the other hand, in Comparative Examples 2 and 3

using only the *ipt* gene (plant hormone synthesis gene) as the selectable marker gene, the desired gene-introduced tissues are 14% and 0%, respectively, among the tissues selected using the morphology as the index (see pages 36 and 37 in the present specification). Therefore, the selection efficiency is much higher using the claimed vector as compared to the vector described in EP '147 or U.S. '791.

Based on the foregoing, Claims 1-13 are not obvious over EP '147 or U.S. '791 in view of Kakimoto et al. Accordingly, withdrawal of these grounds of rejection is respectfully requested.

The rejection of Claims 1-9 for obviousness-type double patenting over Claims 1, 2, and 4-7 of U.S. Patent No. 5,965,791 (U.S. '791) in view of Kakimoto et al. is respectfully traversed.

The claims of the present application are not obvious over Claims 1, 2, and 4-7 of U.S. '791 in view of Kakimoto et al. for the same reasons that the pending claims are not obvious over the complete disclosure of U.S. '791 and Kakimoto et al., as discussed above. Accordingly, withdrawal of this ground of rejection is respectfully requested.

The rejection of the claims under 35 U.S.C. §112, first paragraph, is respectfully traversed.

The rejection is based on Walden and the Examiner's interpretation that this reference teaches that different plant species and plant cell types may require the use of different selectable markers and selection agents for the selection of transformed plant cells.

However, in all of the selectable makers investigated in Walden, antibiotic resistance is used as the marker. In this procedure, after introduction of the genetic material the plant cells are cultured in the presence of the antibiotic, and the resistance against it is evaluated. However, the antibiotic used in this procedure is a chemical substance which is not present in

the plant cells. Accordingly, some plant species and plant cell types have a natural detoxification mechanism against such an exogenous chemical substance. In this case, if a gene resistant to the chemical substance which can be detoxified according to the detoxification mechanism is used as the selectable marker gene, tissues into which the gene has been introduced cannot be selected. This is because the resistance to the antibiotic is also demonstrated in cells into which the selectable marker gene has not been introduced. Accordingly, Walden describes that the nature of the antibiotic and the corresponding antibiotic resistance gene to be used may depend on the specific plant species and cell types (see page 563, right col., line 11 up to page 564, left col., line 4).

On the other hand, in the claimed vector, a plant hormone signal transduction gene is used as the selectable marker gene. The plant hormone signal transduction gene includes various genes such as the *CKI1* gene (see page 10, lines 4-20 in the present specification). As apparent from the detoxification mechanism which functions in the signal transduction pathway of plants and which is indispensable for growth and differentiation of all plants, each of the genes would be commonly kept in plant species with a high homology. For example, the *CKI1* gene and the *CKI2* gene were firstly isolated from *Arabidopsis thaliana.* However, one of ordinary skill in the art would consider that the same *CKI1* gene and *CKI2* gene are present in other plants, for example, tobacco, and woody plants such as *Eucalyptus*.

Accordingly, the products of these genes should be endogenous chemical substances which are expected to be present in a variety of plant cells. Existence of a plant having a detoxification mechanism against such endogenous chemical substances would be generally unreasonable. Also, when the plant hormone signal transduction genes are used as the selectable marker gene, the gene-introduced tissue is directly influenced by the gene, that is, shows morphological abnormality of plant tissue, and can be selected, irrespective of the type

of gene, plant species, and cell type, since there is no influence of a disturbance element of the detoxification mechanism.

The claims are enabled. Accordingly, withdrawal of this ground of rejection is respectfully requested.

The rejection of the claims under 35 U.S.C. §112, second paragraph, is respectfully traversed.

The claims are not interpreted in a vacuum. Rather, the claims are interpreted in light of the specification.

The present application provides a detailed description of the claim terms identified in the specification such one skilled in the art will readily understand the metes and bounds of the claims.

The phrase "plant hormone signal transduction gene" is described in the specification at pages 10-11.

The phrase "removable DNA element" is described in the specification at page 13.

The phrase "plant hormone synthesis gene" is described in the specification at pages 11-12.

The phrase "cytokinin signal transduction gene" is described in the specification at pages 10-11.

The phrase "cytokinin synthesis gene" is described in the specification at page 12.

The phrase "site-specific recombination system" is described in the specification at pages 16-17. In addition, this term is well-recognized in art as demonstrated by Homologous Recombination and Gene Silencing in Plants, Ed., Jerzy Paszkowski, pp. 219-223, a copy of which is enclosed herewith. See the "Introduction" and Table 1.

Based on the foregoing, the claims are definite within the meaning of 35 U.S.C. §112, second paragraph. Accordingly, withdrawal of this ground of rejection is respectfully requested.

Withdrawal of this ground of rejection is respectfully requested.

Applicants submit that the application is in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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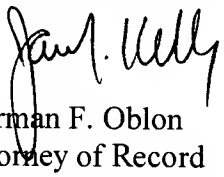

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Serial No.: 09/477,730
Amendment Filed On: January 7, 2002

IN THE CLAIMS

Please amend the claims as follows.

--1. (Amended) A vector for introducing a gene into a plant, which comprises:

a desired gene, wherein the desired gene is not a selectable marker gene, and

a plant hormone signal transduction gene as a selectable marker gene.--

Claims 10-13 (New)